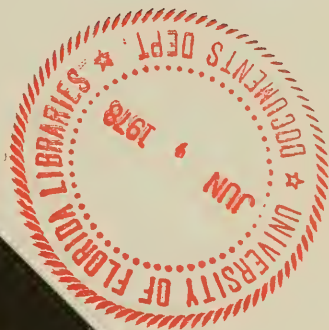


Indoor Gardening

Artificial Lighting,
Terrariums,
Hanging Baskets,
and Plant Selection



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INDOOR GARDENING

Artificial Lighting, Terrariums, Hanging Baskets, and Plant Selection

Prepared by Henry M. Cathey, ARS Research Horticulturist¹
and Lowell E. Campbell, ARS Agricultural Engineer²

PERSONAL PLANTS

You can grow and display many kinds of decorative house plants in your home by using an indoor garden. People are realizing that house plants—displayed in planters equipped primarily with fluorescent lamps—are an attractive asset and a constantly changing decoration for any space in the home. Much of this popularity has been due to the production, distribution, and varieties of house plants that have been made available to the consumer.

Most house plants are grown commercially under a protective covering in artificial growing media and fed

regularly with fertilizers. Care is taken to see that plant diseases and insect pests are controlled. A major aim of the plant industry is to broaden the range of plants—their foliage and their flowering—which can be grown successfully. They have worked to develop easy-to-understand care instructions for handling the plants and to encourage the installation of lighting facilities suitable for showing, acclimatizing, and growing them.

This accomplishment is made possible by cooperation between many specialists. Florists must work with engineers and lighting designers to build the facilities for highlighting and maintaining the plants. Interior designers and architects must mix plants aesthetically with other furnishings. Growers and indoor gardeners must select both the plants and the watering techniques to insure the continued success of the plants.

¹Florist and Nursery Crops Laboratory, Plant Genetics and Germplasm Institute, Beltsville Agricultural Research Center, Beltsville, Md. 20705.

²Agricultural Equipment Laboratory, Environmental Quality Institute, Beltsville Agricultural Research Center, Beltsville, Md. 20705.

TYPES OF INDOOR GARDENS

Most house plants require light to survive in indoor locations. If natural light in the living space is unsufficient to help maintain the plants then artificial light must be used.

To grow plants satisfactorily in an indoor garden one must remember to—

- Water the plants thoroughly, but only often enough to prevent wilting.
- Fertilize the plants every 2 to 4 weeks while they are actively growing.
- Illuminate the plants with fluorescent lamps 12 to 16 hours daily.

Fluorescent lamps have allowed house plants to thrive in indoor gardens—plants that barely existed indoors before the development of such light sources. These lamps have many benefits: they give uniform illumination and emit a minimum amount of heat into the air, they are available in a variety of shapes and sizes, and they give the proper environment for propagation of plants by root cuttings, air layering, or seedlings. Whether the location has some daylight, or little or no daylight, fluorescent lamps provide the proper illumination. (For details see p. 8.)

To determine whether adequate light exists in a location, it is necessary to use a light meter especially designed for measuring artificial lighting. For this, and other light measurement details, see p. 18.

Plans for 11 types of indoor gardens are shown in this bulletin. Anyone who can use woodworking tools should be able to construct an indoor garden by following these general plans.

- **PLAN A** is for a garden about 4

feet long and 12 to 18 inches deep. This long, narrow garden is **most useful in a dimly lighted corridor**. It will brighten as well as decorate the corridor. This version of the indoor garden may also be used as a room divider. (See illustration on p. 5.)

- **PLAN B** is for a free-standing, round garden 14 to 18 inches in diameter and 2 feet tall. It is **used for showing the flowers and foliage of one or several potted plants**. (See illustrations on pp. 6, 7.)

- **PLAN C** is for a table garden about 3 feet tall, 2 feet long, and 1 foot deep. This garden can be placed on almost any surface or hung on the wall. It will light as well as decorate and is **designed for displaying small plants** such as African violets. (See illustrations on pp. 8, 9.)

- **PLAN D** is for a wall garden about 7 feet high and 4 feet wide. The garden can be placed on any open, wall space and gives the appearance of a window. It **allows the attractive display of hanging vines and potted plants**. (See illustrations pp. 10, 11.)

- **PLAN E** is for a free-standing light shell 5 feet tall and 4 feet wide. This garden **permits the display of growing plants in various size containers** and is **suitable in halls, foyers, kitchens, or playrooms**. (See illustrations on pp. 18, 19.)

- **PLAN F** is for a tall, narrow garden 6 feet tall and 2 feet square. It has movable shelves and **permits starting and growing many small plants**. (See illustrations on pp. 22, 23.)

- **PLAN G** is a triangular planter used for **lighting plants of different heights and diameters**. This garden consists of one U-shaped fluorescent lamp 22 inches tall mounted on a triangular-shaped platform that is 12



PN-5260

Corridor or foyer garden (Plan A) is most useful in a dimly lighted corridor. It can also be employed as a room divider.

inches wide. (See illustrations on pp. 24, 25.)

• **PLAN H**, an angular table planter, is for lighting a long platform, 4 feet long, mounted with two U-shaped fluorescent lamps, and backed by plexiglass mirrors each measuring approximately 30 x 10 x 28 inches with a folding panel. The mirror increases the light intensity available to the plants. The folding panel permits the hanging of vines on the front of the garden. (See illustration p. 32.)

• **PLAN I**, an office planter, is for lighting a restricted area of plants. This is accomplished by placing two U-shaped lamps on the two ends of a three-sided box 30 x 10 x 28 inches. The sides of the box are covered with transparent plastic and the back of the box is covered with a mirror to reflect light. The top of the box is open to permit larger plants to be placed in the area. (See illustration on p. 33.)

• **PLAN J** is for a “window-on-the-wall” type of planter made from a



PN-5261

A free-standing, round garden (Plan B) is used for showing the flowers and foliage of one or several plants growing in pots.

2 x 2 foot ceiling fixture, turned on its side, with an 8-inch shelf mounted on the front. The two U-shaped fluorescent lamps are covered with a translucent plastic panel. The fixture may be mounted on the wall to allow space for growth plants in the home. (See illustrations on pp. 34, 35.)

• **PLAN K**, "a garden center", is a freestanding gardening area com-

binning side lighting from U-shaped fluorescent lamps and mirrors to provide uniform illumination. Ballasts and time clock are hidden underneath the lighting area behind a folding panel. Space is also provided for gardening aids such as extra containers, growing media, fertilizers, and other items. (See illustrations on pp. 36, 37.)

Planter Box

Outer Surfaces

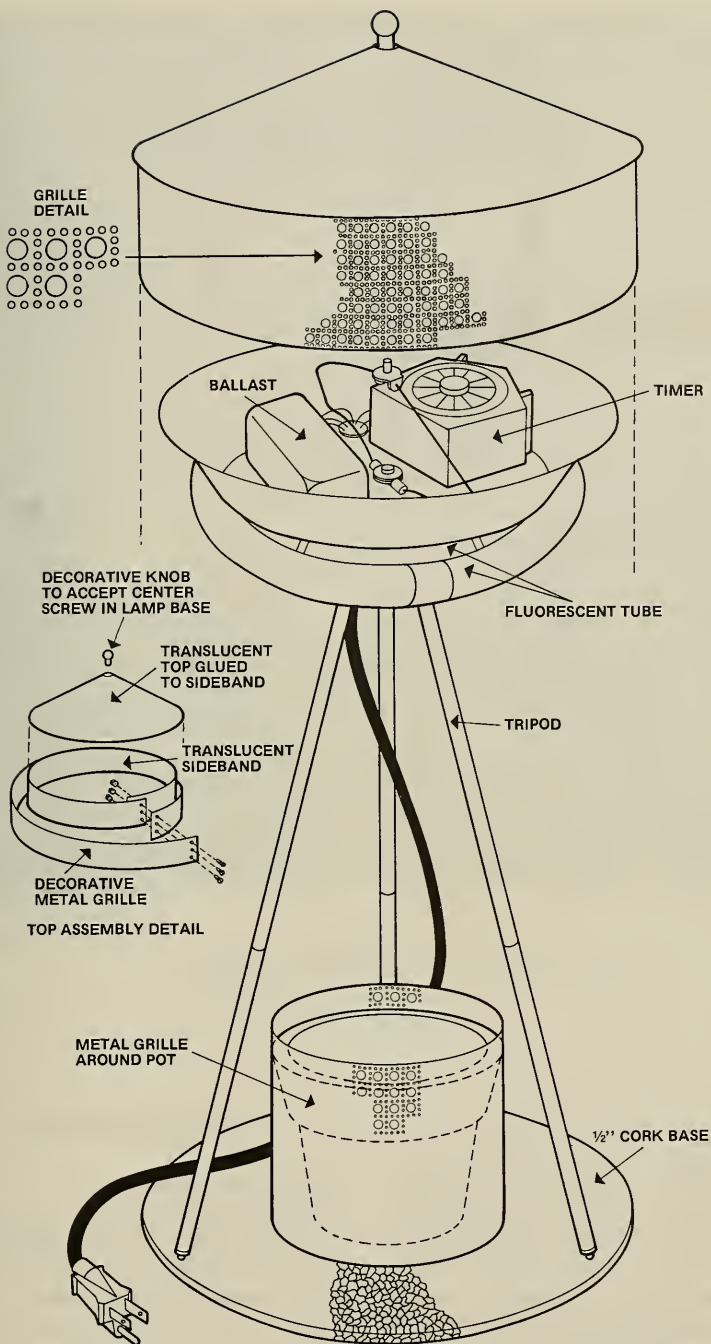
The planter box can be made of soft pine or fir plywood painted to match the walls in the room where it will be used, or it can be made of veneered plywood stained or oiled to match the furniture with which it will be displayed. Many kinds of wood and wood finishes are available that are suitable for planters.

Also, the planter box can be covered with one of the following fire-resistant surfaces:

- Indoor-outdoor carpet.
- Plastic film that comes in many colors and has a mirrorlike finish.
- Coverings with adhesive backing. They come in woodlike and metalike finishes and in patterns of mod flowers, which give almost unlimited design possibilities.
- Laminated plastic used for kitchen-counter tops.

Inner Surfaces

Inside the planter is a watertight liner. This liner is best made of galvanized sheet metal painted with asphalt to retard rusting. For a temporary liner, two layers of polyethylene may be stapled inside the planter.



Plan B.—Free-standing garden for pot plants.



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Table garden (Plan C) can be placed on any surface or hung on a wall. It is ideal for displaying small plants such as African violets.

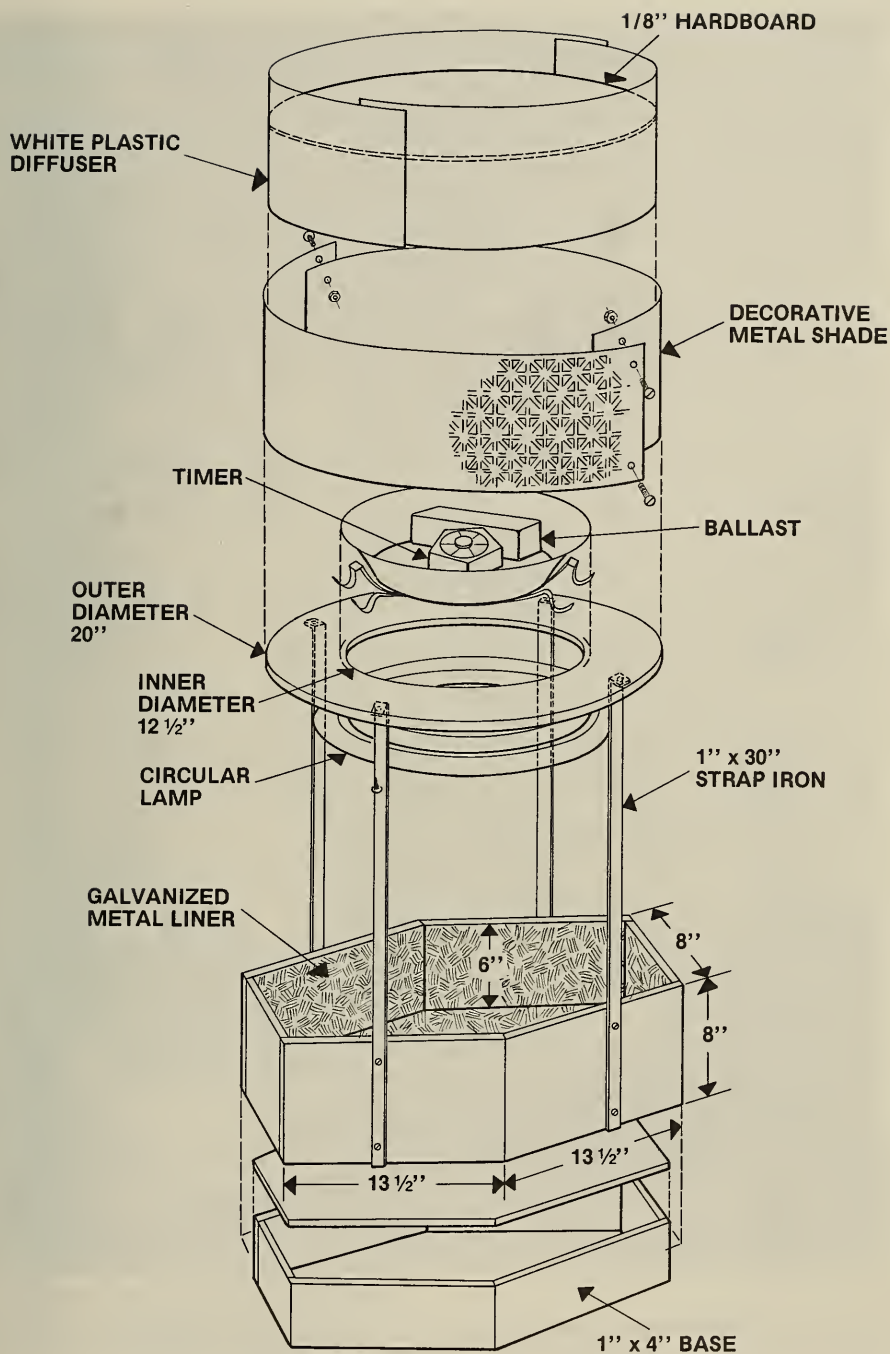
Mobility

The planter box is mounted on a platform equipped with casters. Carpet casters are available. The entire unit can be moved easily; floors and carpets around it can be cleaned; plants in the garden can be reached easily for care and replacement; and the contents of the room—garden as well as furniture—can be rearranged easily.

Lighting Systems

Fluorescent Lamps

Fluorescent lamps are most widely used for lighting indoor plants. Standard 40-watt lamps produce enough light for plants with medium or low-light requirements. (See the table "Illumination In Foot-Candles At Various Distances From Cool White Or Warm White Fluorescent Lamps" on



Plan C.—Table garden to display small plants.



PN-5263

Wall garden (Plan D) makes possible an attractive display of hanging vines. Potted plants can be placed at the base of this indoor garden.

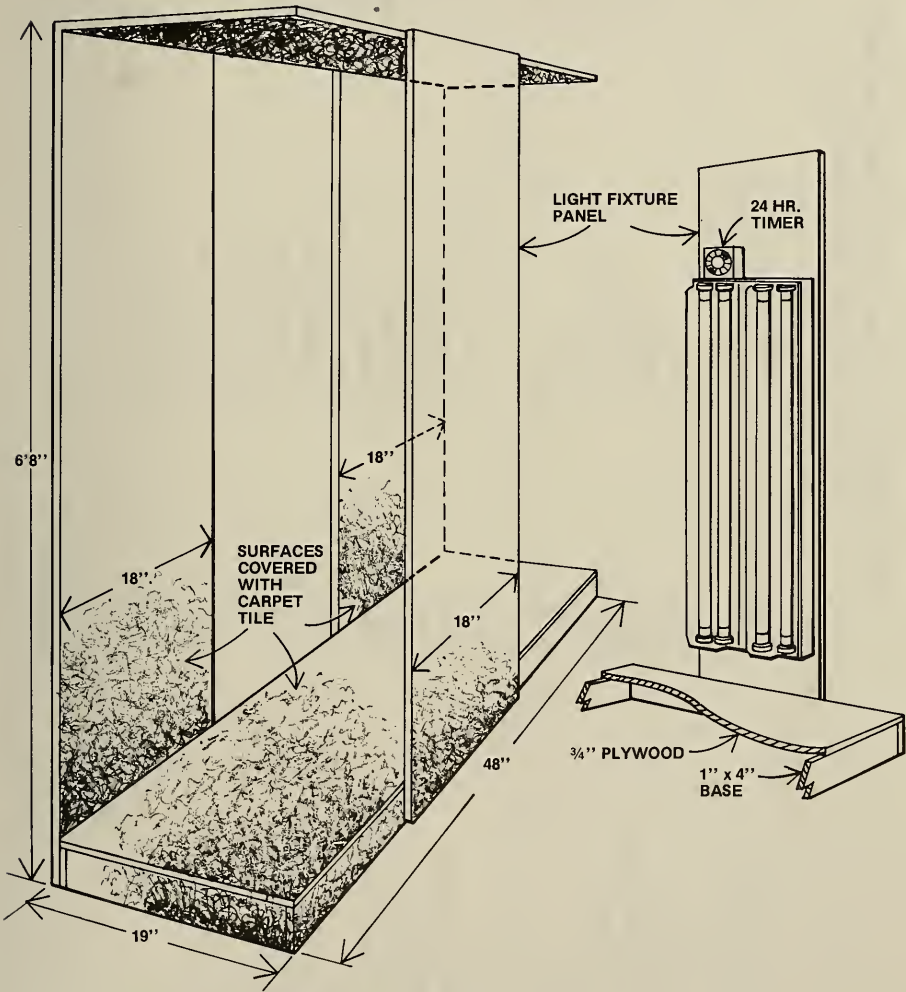
p. 14.) High light requirements may indicate the use of 1500 MA³ - type fluorescents.

The color of lamps used is a compromise between cost, efficiency, esthetics, and color rendering of the plants. As an aid to both the amateur and professional interior designer the table "Color Rendering of Plants,

People, and Furnishings" is supplied on p. 12.

Most plants will do well with adequate visible radiation from any fluorescent lamp except yellow and red. The power consumed is the same for all lamps of equal wattage. Incandescent lamps are seldom satisfactory except for spotlighting displays or flowers. (See the table "Relative Light and Visible Radiation of 40-Watt Fluorescent Lamps" on p. 15.)

³Lamp current in milliamperes.



Wall garden (Plan D) can display both hanging vines and potted plants.

Color Rendering of Plants, People, and Furnishings (For the Consulting Interior Designer.)



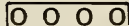

Lamp Fluorescent	Abbreviation	General Appearance on a Neutral Wall or Surface	Complexion (the actual appearance of skin)
Cool White ¹	CW	White	Pale Pink
Warm White	WW	Yellowish	Sallow
Gro Lux, Plant Light	GRO	Pink White	Reddish
Gro Lux-WS	GRO-WS	Light Pink-White	Pink
Agro-lite	AGRO	White	Pink
Vita-lite	VITA	White	Pink
Discharge			
Mercury (all types)	HG	Purplish White	Ruddy
Metal Halide	MH	Greenish White	Greyed
High-Pressure Sodium	HPS	Yellowish	Yellowish
Low-Pressure Sodium	LPS	Yellow	Greyed
Incandescent	INC	Yellowish White	Ruddy
Incandescent-Mercury	INC-HG	Yellowish White	Ruddy


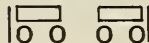
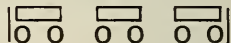
Abbreviation	Atmosphere (the effect or general feeling of room)	Colors Improved or Strengthened	Flower Color Greyed (undesirable)
CW	Neutral to cool	Blue, Yellow, Orange	Red
WW	warm	Yellow, Orange	Blue, Green, Red
GRO, PL	warm	Blue, Red	Green, Yellow
GRO-WS	warm	Blue, Yellow, Red	Green
AGRO	warm	Blue, Yellow, Red	Green
VITA	warm	Blue, Yellow, Red	Green
HG	cool	Blue, Green, Yellow	Red
MH	cool green	Blue, Green, Yellow	Red
HPS	warm	Green, Yellow, Orange	Blue, Red
LPS	warm	Yellow	All Except Yellow
INC	warm	Yellow, Orange, Red	Blue
INC-HG	warm	Yellow, Orange, Red	Blue




¹Deluxe Cool White or Deluxe Warm White will give better color rendition than Standard Cool White or Warm White.

ILLUMINATION IN FOOTCANDLES AT VARIOUS DISTANCES
FROM COOL WHITE OR WARM WHITE FLUORESCENT LAMPS¹

FLUORESCENT				
Distance from Lamp Feet	40 Watt U-Lamp ²			
	FC12T10	F40-U	F40-U	2-F40-U
		O=O	O=O	O=O O=O
0.5	330			
1	140	150	240	300-400
2	45	50	80	100-200
3	20	25	40	50-100

Standard 40 Watt T12 ³				
	2-F40	2-F40	4-F40	6-F40
				
0.5	500	700	900	1000
1	260 (200)	400 (260)	600	700
2	110 (100)	180 (150)	330	450
3	60 (60)	100 (90)		
4	40	60	100	140

1500 MA T12-T17 ⁴				
	2-F48	4-F48	6-F48	
				
1	900	1700	2000	
2	400	740	1100	

INCANDESCENT Standard Lamp			INCANDESCENT PAR-38	
	40 W	60 W	75 W	150 W
				
1	34 (17)	67 (33)		
2	8 (7)	17 (13)		
3	4 (3)	7 (7)	375 (40)	383 (80)
4			167 (40)	216 (110)
5	(double values with reflectors)		94 (50)	138 (90)
6			60 (40)	96 (70)

¹ Values in parenthesis are footcandles one foot on either side of lamp perpendicular to distance below lamps.
² Bottom views.
³ End views.
⁴ End views.

RELATIVE LIGHT AND VISIBLE RADIATION OUTPUT OF 40-WATT LAMPS

40-Watt Lamp type Fluorescent	Percent Lumens	Percent Visible Radiation
Cool White	100	100
Warm White	100	100
Plant Growth	32 to 60	70 to 80
Wide Spectrum - Color Rendering Index (CRI) 90 or above	60 to 70	75 to 85

Fluorescent tubes should be replaced periodically when they are significantly dimmer than new lamps. For standard lamps (400-450 MA) this will be 1 or 2 years when operated 15 hours a day. For 1500 MA lamps replacement each year is recommended.

Some lamps will become dimmer in less time while other lamps may last longer. Keep extra lamps on hand for replacement. Remember that a fixture for two lamps will not operate with only one lamp. Stagger lamp replacement over a period of several weeks to avoid abrupt changes in light level. For the first 4 or 5 days new lamps may be up to one-fifth brighter than they will be subsequently.

It is important to know the different ways that plants respond to the variety of lamps that may be employed. (See table "Lamps And Plant Response" on p. 16 for this information.)

Light Conversion

It is important to use equal energy when converting from one light source to another. Living spaces are lit with natural available light and

with many different kinds of lamps. Fluorescent and incandescent lamps are the types most frequently used. Each lamp has a different visible spectrum. To convert from one lamp source to another, use the table "Appropriate Foot-Candles For Equal Radiant Energy" on p. 20.

Lighting Fixtures

Standard fluorescent lighting fixtures or luminaires are most easily utilized. Strip or channel fixtures or general lighting fixtures can be used as shown in the plans. Four-foot lamps, or the U-lamp (slightly less than 2 feet overall in length) are easy to employ.

Electrical connections require a three-prong plug both for safety and positive operation of the lamps. Ungrounded fixtures or lamps without grounded metal reflectors may not operate reliably. Especially noisy fixtures may require ballast replacement.

Components, available at electrical supply stores, can be wired when standard fixtures are not convenient. (Always have qualified persons install the wiring and make sure the wiring meets the local and National Elec-

LAMPS AND PLANT RESPONSE

Lamp	Plant Response
Fluorescent - Cool White (CW) and Warm White (WW).	<ul style="list-style-type: none"> • Green foliage expands parallel to the surface of the lamp. • Stems elongate slowly. • Multiple side shoots develop. • Flowering occurs over a long period of time.
Fluorescent - Gro Lux (GL) Plant Lights (PL).	<ul style="list-style-type: none"> • Deep-green foliage which expands, often larger than on plants grown under CW or WW. • Stem elongates very slowly, extra thick stems develop. • Multiple side shoots develop. • Flowering occurs late, flower stalks do not elongate.
Fluorescent - Gro Lux-WS (GL-WS), Vita-lite (VITA), Agro-lite (AGRO) and Wide Spectrum lamps.	<ul style="list-style-type: none"> • Light-green foliage which tends to ascend toward the lamp. • Stems elongate rapidly, distances between the leaves. • Suppresses development of multiple side shoots. • Flowering occurs soon, flower stalks elongated, plants mature and age rapidly.
High Intensity Discharge - Deluxe Mercury (HG) or Metal halide (MH).	<ul style="list-style-type: none"> • Similar to CW & WW fluorescent lamps compared on equal energy. • Green foliage which expands. • Stems elongate slowly. • Multiple side shoots develop. • Flowering occurs over a long period of time.
High Intensity Discharge - High pressure sodium (HPS).	<ul style="list-style-type: none"> • Similar to Gro Lux and other color improved fluorescent compared on equal energy. • Deep-green foliage which expands, often larger than on plants grown under H and MH. • Stems elongate very slowly, extra thick stems develop. • Multiple side shoots develop. • Flowering occurs late, flower stalks do not elongate.

LAMPS AND PLANT RESPONSE

Lamp	Plant Response
High Intensity Discharge - Low Pressure Sodium (LPS)	<ul style="list-style-type: none"> • Extra deep-green foliage, bigger and thicker than on plants grown under other light sources. • Stem elongation is slowed, very thick stems develop. • Multiple side shoots develop even on secondary shoots. • Flowering occurs, flower stalks do not elongate. <p>Exceptions: Saintpaulias, lettuce, and Impatiens must have supplemental sunlight or incandescent to insure development of chlorophyll and reduction of stem elongation.</p>
Incandescent (INC) and Incandescent-Mercury (INC-HG)	<ul style="list-style-type: none"> • Paling of foliage, thinner and longer than on plants grown under light sources. • Stem elongation is excessive, eventually become spindly and easily breaks. • Side shoot development is suppressed, plants expand only in height. • Flowering occurs rapidly, the plants mature and senescence takes place. <p>Exceptions: Rosette and thick-leaved plants such as Sansevieria may maintain themselves for many months. The new leaves which eventually develop will elongate and will not have the typical characteristics of the species.</p>

trical Code.) The components necessary are—

- *Lampholders.* Two are required for each lamp. (U-tubes require special lampholders available at electrical supply stores.)

- *Ballast.* This is a built-in power regulator.

- *Wire.* Insulated, heat-resistant type.

- *Metal enclosure.* This will house the ballast and the wiring to the lampholders.

Automatic Timers

Plants need light for 8 to 12 hours a day. Use an automatic timer to control the length of illumination. Do not depend on your memory to turn on the lamps at the proper time.

An automatic timer is available at hardware and electrical stores. The timer can be set to turn the lamps on and off at any time. For 16 hours of light, you can set it to turn on at 6 a.m. and off at 10 p.m.

Light Levels

Light level determines the types of plants that can be grown. Recommended light levels for plants are given in foot-candles (fc). A foot-candle is a unit of illumination equal

to the amount of light thrown by one standard candle on a surface 1 foot away.

Plants will grow in higher light levels than the preferred levels to be mentioned, but they will *not* survive *below* minimum levels of light.



PN-5264

Free-standing light shell (Plan E) permits the display of plants in various size containers.

In sunlight:

Low designates a minimum light level of 12 foot-candles and a preferred level of 35 to 100 foot-candles.

Medium designates a minimum of 35 foot-candles and a preferred level of 100 to 250 foot-candles.

High designates a minimum of 100 foot-candles and a preferred level of 250 foot-candles.

Very High designates a minimum of 500 foot-candles and a preferred level of over 500 foot-candles.

Using Artificial Light with cool white fluorescent lamps as the standard:

Low designates a minimum light level of 25 foot-candles and a preferred level of 75 to 100 foot-candles.

Medium designates a minimum of 75 to 100 foot-candles and a preferred level of 200 to 500 foot-candles.

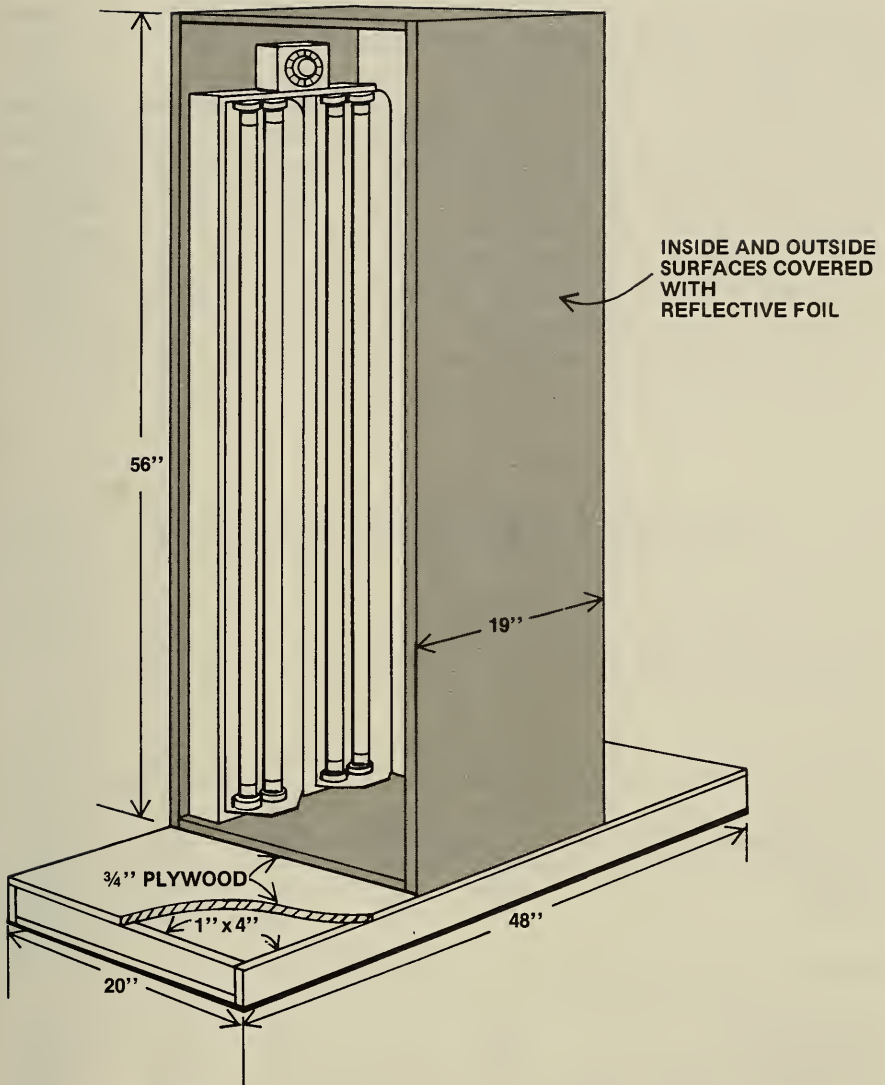
High designates a minimum of 200 foot-candles and a preferred level of 500 foot-candles.

Very High designates a minimum of 1000 foot-candles and a preferred level of over 1000 foot-candles.

Measuring Light Levels

If the natural light in the living space is insufficient to maintain the plants then artificial light must be used. To determine if adequate light exists, it is necessary to use a light meter.

Models, typically, have several



Free-standing light shell (Plan E) is suitable for halls, foyers, kitchens, and playrooms.

ranges, such as from 10 to 50 foot-candles, 50 to 250 foot-candles, and 200 to 1000 foot-candles with an X-10 multiplying cover.

Such meters are worked by positioning their tops parallel to the surface being measured for light. Then the switch position is shifted from high to medium to low to determine the intensity of light measured in foot-candles. Several readings should be taken and the results averaged to

determine the proper light measurement.

Photographic light meters are not fully satisfactory for measuring plant lighting because the lighting conversions and corrections required are complex due to spectral variations and vary with various meters. However, they can be used to determine relative levels of daylight or incandescent light.

The purchase of a light meter

Appropriate Foot-candles¹ for Equal Radiant Energy
(Visible 400-850 nm) for Selected Lamps

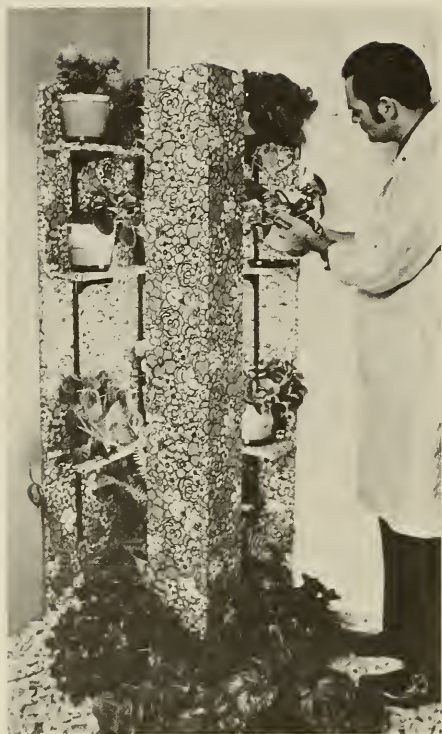
Lamp		fc	fc	fc	fc
<i>Fluorescent</i>					
Cool White	CW	100	200	500	1000
Warm White	WW	105	210	525	1050
Gro-Lux, Plant Light	GRO	47	94	235	470
Gro-Lux-WS	GRO/WS	68	136	340	680
Agro-lite	AGRO	74	148	370	740
Vita-lite	VITA	80	160	400	800
<i>Discharge</i>					
Mercury (all types)	HG	108	216	540	1080
Metal Halide	MH	87	174	435	870
High-Pressure Sodium	HPS	88	176	440	880
Low-Pressure Sodium	LPS	137	274	685	1370
Incandescent	INC	35	70	175	350
Incandescent-Mercury	INC-HG	50	100	250	500
Sunlight:					
Winter		53	106	265	530
Summer		55	110	273	546

¹The foot-candle readings given in the Plant Guide are based on Cool White fluorescent lamps. Note that when the table lists 100 fc of Cool White fluorescent, it requires 53 fc from sunlight, 105 fc from Warm White, 47 fc from Gro-Lux, 68 fc from Gro-Lux-WS to give equal energy and equal effectiveness for lighting plants. Check with a lighting engineer to find out what kind of artificial lamps are used to light the space.

Input Power Conversion of Light Sources

Fluorescent	Input Power Total Watt	Lamp Watt	Total Lumens per Lamp	Total Lumen per Watt	Visible Radiation Percent	Nonvisible Radiation Percent	Conduction & Convection Percent	Ballasts Loss Percent	Conversion of Foot- candles to Approximate Watts/Meter ¹ - Divide Foot- candles By:
Cool White	46	40	3,200	70	20	32	35	13	32
Warm White	46	40	3,250	71	20	32	35	13	32
Gro Lux, Plant Light	46	40	925	20	13	35	39	13	14
Gro Lux-WS	46	40	1,700	37	15	35	37	13	21
Agro-lite	46	40	1,900	41	15	35	37	13	23
Vita-lite	46	40	2,180	47	18	33	36	13	25
Discharge									
Mercury Deluxe	440	400	22,000	50	13	62	16	09	34 (All types Hg)
Metal Halide	460	400	34,000	75	20	54	13	13	28
High Pressure Sodium	470	400	47,000	100	25	47	13	15	27
Low-Pressure Sodium	230	180	33,000	143	25	47	13	15	43
Incandescent									
Incandescent-Mercury	100	100	1,740	17	07	83	10	0	10
	-	-	-	18-25	-	-	-	-	15

¹400-850 nanometers.



PN-5265

Tall, narrow garden (Plan F) offers the flexibility of movable shelves and will permit the starting and growing of many small plants.

especially designed for measuring artificial lighting is recommended.

Other pointers to remember when taking light readings with a meter:

- Pick a day when it is sunny.
- Adjust curtains to their usual daytime position. Drawn curtains, whether sheer or opaque, greatly alter the light level.

Some plants will not do well indoors. These plants are sun lovers, and though the lamps in the indoor garden are bright, they are still pale and weak when compared to the sun. The midday summer sun produces 5,000 to 10,000 foot-candles of light,

which is very bright compared to indoor lighting.

SELECTING A LOCATION

The best place to put an indoor garden is where the temperature during the day is about 75° F. and the temperature during the night is about 65° F.

Avoid locations near heating ducts, exhaust fans, or doorways to the outside. Air from heating ducts heats and dries the plants. Cold air and drafts from exhaust fans and outside doors may chill the plants.

It is a good idea to avoid placing planters in heavy traffic areas in the home. Not only is the planter often in the way where traffic is heavy, but plants in the garden are likely to be damaged by passing traffic.

Wherever it is used, an indoor garden will light the ceiling and walls as well as the plants. This extra light may be welcome; it may serve as the secondary source of illumination for the room. But it may be unwelcome—producing glare, rather than brightness. Indoor light levels of only 1,000 foot-candles can disturb the eyes of some people. Screening the lights with foliage will reduce glare. Directed glare can be avoided through the use of shields and by careful location of the lights.

STOCKING THE GARDEN

The degree of satisfaction that your garden brings you depends, more than anything else, on your selection of plants for it—plants that are both attractive and adaptable to growing indoors. Your skill in arranging the plants that you select can add to your enjoyment of the garden.

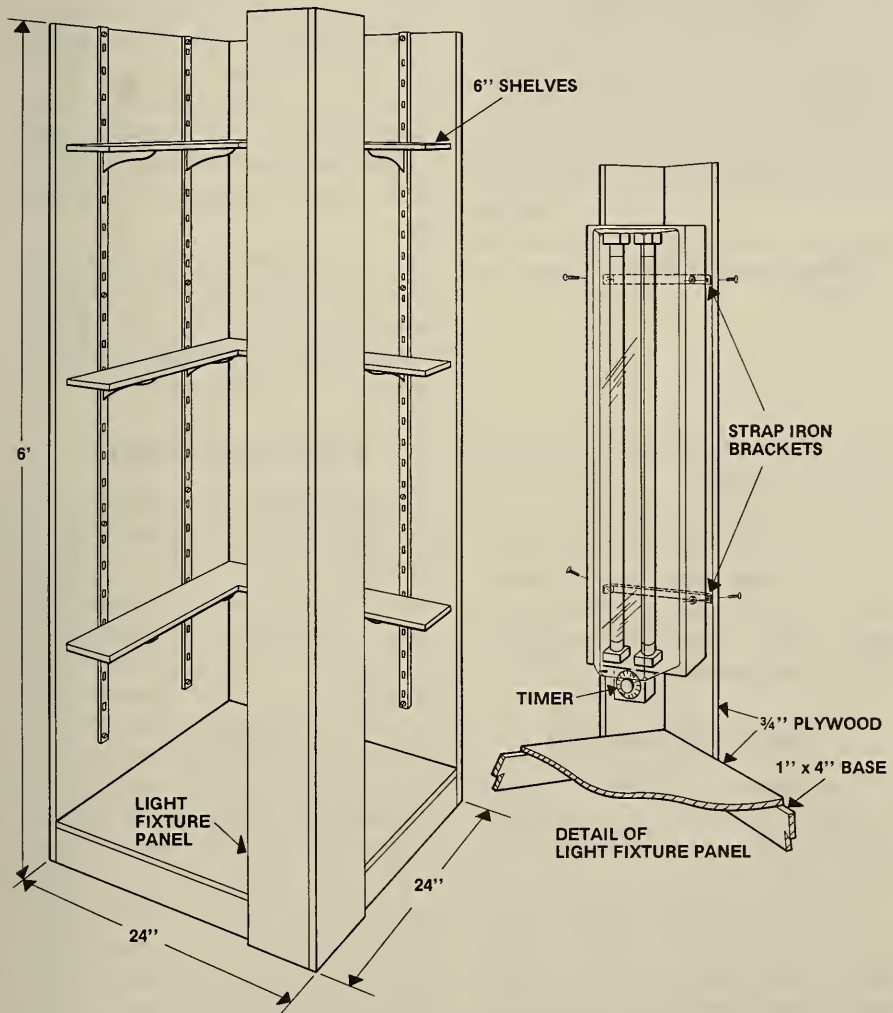
Plants should not be planted directly in the indoor garden; they should be potted and the pots set in the garden. This method of handling the plants allows you to rearrange your garden periodically.

You can use seasonal plants in your garden—poinsettias at Christmas, azaleas or tulips at Valentine's Day, lilies at Easter, hydrangeas for Mother's Day, potted

annuals during summer, or potted chrysanthemums in fall. Your garden should never remain static; it would soon become unattractive.

Plant Guide

The guide (p. 26) lists three points to consider in selecting decorative plants for the indoor garden—size of the mature plant, light level needed



Tall, narrow garden (Plan F) with movable shelves is 6 feet tall and 2 feet square.



PN-5266

Triangular planter (Plan G) is suitable for lighting plants of different heights and diameters.

Floor plant designates plants that grow 2 to 6 feet tall. They are used separately or in a grouping—often as a room divider or a screen.

Pot plant designates a wide range of plants of varying sizes that grow in different size pots, up to 8 inches in diameter.

Terrarium plant designates plants that have relatively small leaves and can be grown in a closed bottle, aquarium, or jar. They are used in a grouping, intermixing plants with different colors and shapes of leaves.

Hanging plant designates plants that can be trained to cascade from hanging baskets. Many of these plants can be vining types; other plants, because of their growth habits, may be adapted to this special use.

These pot plants can be used separately, double-potted in waterproof containers, or lined up in a planter box giving the impression of plants growing directly in the box.

Setting The Plants

Support large potted plants by setting them on other clay pots that are upended in the bottom of the planter box. Fill in around the upended pots with coarse gravel to a depth of 3 or 4 inches. Then fill the rest of the box around the potted plants with unmilled sphagnum moss, pea-size gravel, or marble chips. Small potted plants can be plunged directly into the sphagnum, pea gravel, or marble.

Although the fluorescent lamps used in the garden are not as hot as incandescent lamps, they generate enough heat to harm plants that come in contact with them. Therefore, keep all plants at least 6 inches away from the lamps.

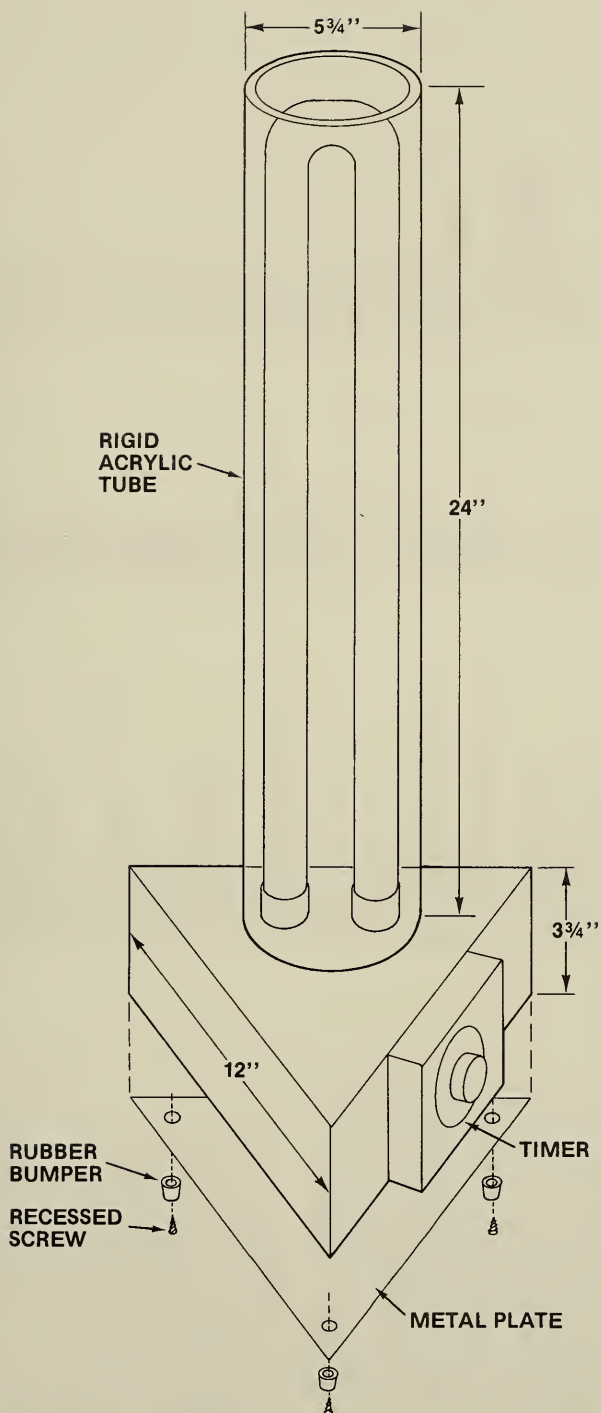
for healthy plant growth, and the water requirement.

The list of plants is not all inclusive. Plants are listed that are available through usual supply sources and have been grown successfully in many homes. Hobbyists may enjoy trying other plants.

Plant Designations

Tree designates plants that grow as a single plant in a container, minimum size 3 feet, maximum size often to the ceiling.

These tall plants may eventually have to be air-layered (see p. 47), cut back to force growth of side shoots, or be given to someone who has more space.



Plan G.—Triangular planter consists of one U-shaped fluorescent lamp mounted on a triangular platform.

DECORATIVE PLANTS FOR THE INDOOR GARDEN

Name	Mature Size	Light Level	Water Requirement
Abutilon species (Flowering - maple)	pot, hanging plant	high	moist
<i>Acalypha hispida</i> (Chenille plant)	pot plant	high	moist
<i>Achimenes</i> (Magic flower)	pot, hanging plant	high	moist - in ground dry - when dormant
<i>Adiantum</i> species (Maidenhair fern)	pot, hanging, terrarium plant	medium	wet
<i>Aechmea fasciata</i> (Bromeliad)	pot plant	medium	moist
<i>Aeschynanthus javanicus</i> (Lipstick plant)	pot hanging plant, terrarium	medium	moist
<i>Aglaonema commutatum</i> (Chinese evergreen)	pot plant	low	moist
<i>Aglaonema "Pseudo-bracteatum"</i> (Golden aglaonema)	pot plant	low	moist
<i>Aglaonema roebelinii</i> (Peuter plant)	pot plant	low	moist
<i>Aloe variegata</i>	pot plant	low	dry
<i>Alternanthera beutzickiana</i>	pot, hanging, terrarium plant	very high	moist
<i>Ananas comosus</i> (Pineapple)	pot plant	high to medium	moist
<i>Aphelandra squarrosa</i> (Zebra plant)	pot, terrarium plant	high	moist
<i>Araucaria excelsa</i> (Norfolk island pine)	tree, floor, pot plant	high	moist
<i>Ardisia crispa</i> (Coral ardisia)	pot plant	medium	moist
<i>Asparagus sprengeri</i> (Asparagus fern)	pot plant	medium	moist
<i>Aspidistra elatior</i> (Cast-iron plant)	floor, pot plant	low	moist
<i>Asplenium nidus</i> (Bird's nest fern)	pot plant	medium	moist
<i>Aucuba japonica</i> (Japanese laurel)	pot plant	medium	wet
<i>Begonia rex</i>	pot, hanging plant	high	dry
Begonias, other than <i>metallica</i> and <i>rex</i>	pot plant	very high	moist
<i>Beloperone guttata</i> (Shrimp plant)	pot, hanging plant	high	moist
<i>Bougainvillea glabra</i> (Bougainvillea)	pot, hanging plant	high	dry
<i>Brassia actinophylla</i> (Schefflera)	tree, floor, pot plant	very high	dry
Bromeliads (many species)	pot plant, hanging	medium	dry
<i>Browallia spectiosa</i> (Browallia)	pot, hanging plant	medium	moist
		high to medium	moist

<i>Caladium</i> (Fancy-leaved caladium)	pot plant	high	moist-dry (dormant)
<i>Calathea</i> species (Calathea)	pot plant	medium	moist
<i>Campanula isophlla</i> (Star-of-Bethlehem)	pot, hanging plant	high	moist
<i>Capiscum annum</i> (Christmas pepper)	pot, hanging plant	high	moist
<i>Chamaedorea elegans</i> (Neanthe bella palm)	floor, pot plant	low	moist
<i>Chamaedorea erumpens</i> (Bamboo palm)	tree, floor, pot plant	low	moist
<i>Chamaeropsis humilis</i> (European fan palm)	tree, floor plant	high	moist
<i>Chlorophytum</i> (Spider plant)	pot, hanging, terrarium plant	medium	moist
<i>Chrysanthemum morifolium</i> (Chrysanthemum)	pot plant	very high	moist
<i>Cissus antarctica</i> (Kangaroo vine)	pot, hanging, terrarium plant	high	moist
<i>Cissus rhombifolia</i> (Grape ivy)	pot plant	medium	dry
<i>Citrus mitis</i> (Calamondin)	pot plant	high	dry
<i>Clerodendrum thomsonae</i> (Bleeding-heart vine)	pot, hanging plant	high to medium	moist
<i>Clivia</i> (Kaffir-lily)	pot plant	medium	dry
<i>Codiaeum</i>	tree plant	very high	dry
<i>Coffea arabica</i> (Arabian coffee tree)	pot, hanging plant	medium	moist
<i>Coleus</i>	pot, hanging, terrarium plant	very high	wet
<i>Columnnea</i> species (Columnnea)	pot, hanging, terrarium plant	medium	moist
<i>Cordyline terminalis</i> (Hawaiian ti plant)	tree, floor, pot plant	medium	dry
<i>Crassula</i>	pot plant	very high	moist
<i>Crossandra infundibuliformis</i>	pot plant	medium	moist
<i>Cryptanthus</i> species (Dwarf bromeliad)	pot, terrarium plant	medium	dry
<i>Cyclamen</i> species (persicum or other species)	pot plant	high	moist-dry (dormant)
<i>Cyperus alternifolius</i>	Umbrella plant	medium	wet
<i>Cyrtomium falcatum</i> (Japanese holly fern)	pot plant	medium to low	moist
<i>Davallia fejeensis</i> (Figi rabbit's-foot fern)	pot, hanging plant	low	moist
<i>Dieffenbachia amoena</i> (Dumb cane)	floor, pot plant	medium	dry
<i>Dieffenbachia "Exotica"</i> (Dumb cane)	pot, terrarium plant	medium	dry
<i>Dizygotheca elegantissima</i> (Spider aralia)	floor, pot plant	high	moist
<i>Dracaena deremensis</i> (Green dracaena)	floor, pot plant	medium	wet
<i>Dracaena deremensis "Warneckei"</i> (White striped dracaena)	pot plant	medium	dry

DECORATIVE PLANTS FOR THE INDOOR GARDEN

Name	Mature Size	Light Level	Water Requirement
<i>Dracaena fragrans massangeana</i> (Corn plant)	floor, pot plant	low	wet
<i>Dracaena godseffiana</i> (Gold-dust dracaena)	pot plant, terrarium plant	medium	wet
<i>Dracaena marginata</i> (Dragon tree)	tree, floor plant	medium	wet
<i>Epiphyllum hybrids</i> (Orchid cactus)	pot, hanging plant	high	moist-in growth dry-over winter
<i>Episcia</i> (Flame-violet)	pot, hanging, terrarium plant	medium	moist
<i>Eriobotrya japonica</i> (Japanese loquat)	tree	high	moist
<i>Euphorbia mili (splenders)</i> (Crown-of-thorns)	pot plant	high	dry
<i>Euphorbia pulcherrima</i> (Poinsettia)	pot plant	very high	dry
<i>Exacum affine</i>	pot, hanging plant	medium	moist
<i>Fatsia japonica</i> (Japanese aralia)	floor, pot plant	medium	moist
<i>Ficus benjamina exotica</i> (Weeping java fig)	tree	medium	moist
<i>Ficus elastica "Decora"</i> (Rubber plant)	tree, floor, pot plant	medium	moist
<i>Ficus lyrata</i> (Fiddle leaf fig)	tree, floor plant	medium	moist
<i>Ficus philippinensis</i> (Philippine fig)	tree, floor plant	medium	moist
<i>Ficus repens</i> var. <i>pumila</i> (Creeping fig)	pot, hanging plant	medium to low	moist
<i>Ficus retusa nitida</i> (India laurel)	tree	medium	moist
<i>Fittonia verschoffeltii</i>	pot, terrarium plant	medium	moist
<i>Fuchsia</i>	pot, hanging plant	medium	moist
<i>Gardenia jasminoides</i> (Gardenis)	pot, hanging plant	very high	moist
<i>Gynura aurantiaca</i> (Velvet plant)	pot plant	very high	moist
<i>Gynura Sarmientosa</i> (Velvet plant)	pot, hanging, terrarium plant	medium	moist
<i>Haemanthus coccineus</i> (Blood lily)	pot, hanging, terrarium plant	medium	moist
<i>Haworthia species</i> (Haworthia)	pot plant	very high	moist-during growth dry-when dormant
<i>Helxine soleirolii</i> (Baby's-tears)	pot, terrarium plant	medium	dry
<i>Hibiscus rosa-sinensis</i> (Rose-of-China)	pot, terrarium plant	medium	moist
<i>Howeia forsteriana</i> (Kentia palm)	pot plant	very high	moist
<i>Hoya carnosa</i> (Wax plant)	tree, floor plant	low	moist
	pot, hanging plant	medium	dry

<i>Impatiens</i>					
<i>Jacobinia obtusior</i> (Plume flower)	pot, hanging, terrarium plant	very high	moist		
<i>Kalanchoe</i> species	pot plant	medium	moist		
<i>Lantana camara</i> (Trailing lantana)	pot, hanging plant	high	dry		
<i>Lantana montevidensis</i> (Trailing lantana)	pot, hanging plant	high	high		
<i>Ligustrum lucidum</i> (Wax leaf privet)	pot, hanging plant	high	dry		
<i>Maranta leuconeura</i> (Prayer plant)	tree, floor plant	medium	dry		
<i>Mimosa pudica</i> (Sensitive plant)	pot, hanging, terrarium plant	medium	moist		
<i>Monstera deliciosa</i> (Ceriman or Mexican Breadfruit)	pot, hanging plant	high	moist		
<i>Naomaria northiana</i> (Apostle plant)	pot plant	low	moist		
<i>Neoregelia spectabilis</i> (Fingernail plant)	pot plant	medium	wet		
<i>Nephrolepis exalata bostoniensis</i>	pot plant	medium	moist		
(Boston fern)					
<i>Nerium oleander</i> (Oleander)	pot, hanging, terrarium plant	medium	moist		
<i>Nertera depressa granadensis</i> (Bead plant)	floor, pot plant	high	dry		
Orchids (many species)	pot, terrarium plant	high	moist		
<i>Pandanus veitchii</i> (Screw-pine)	pot, hanging plant	very high	moist/dry		
<i>Passiflora</i> species (Passion-flower)	floor, pot plant	medium	dry		
<i>Pathenocissus benryana</i> (Ampelopsis)	pot, hanging plant	very high	moist		
<i>Pelargonium</i> species (Geranium)	pot, hanging plant	medium	moist		
<i>Pellionia daveauana</i> (Trailing watermelon-begonia)	pot, hanging plant	very high	dry		
<i>Peperomia caperata</i> (Emerald ripple)	pot, hanging, terrarium plant	medium	moist		
<i>Peunia hybrida</i> (Cascade type)	pot, hanging plant	low	dry		
<i>Philodendron</i> hybrids (Self-heading philodendron)	pot, hanging plant	very high	moist		
<i>Philodendron oxycardium</i> Common philodendron)	floor, pot plant	medium	moist		
<i>Phoenix roebelenii</i> (Dwarf date palm)	pot, hanging plant	low	dry		
<i>Pilea microphylla</i> (Artillery plant)	floor, pot plant	medium	wet		
<i>Pittosporum tobira</i> (Mock orange)	pot, hanging plant	medium	moist		
<i>Plectranthus australis</i> (Swedish-ivy)	pot, hanging terrarium plant	high	dry		
		medium	moist		

DECORATIVE PLANTS FOR THE INDOOR GARDEN

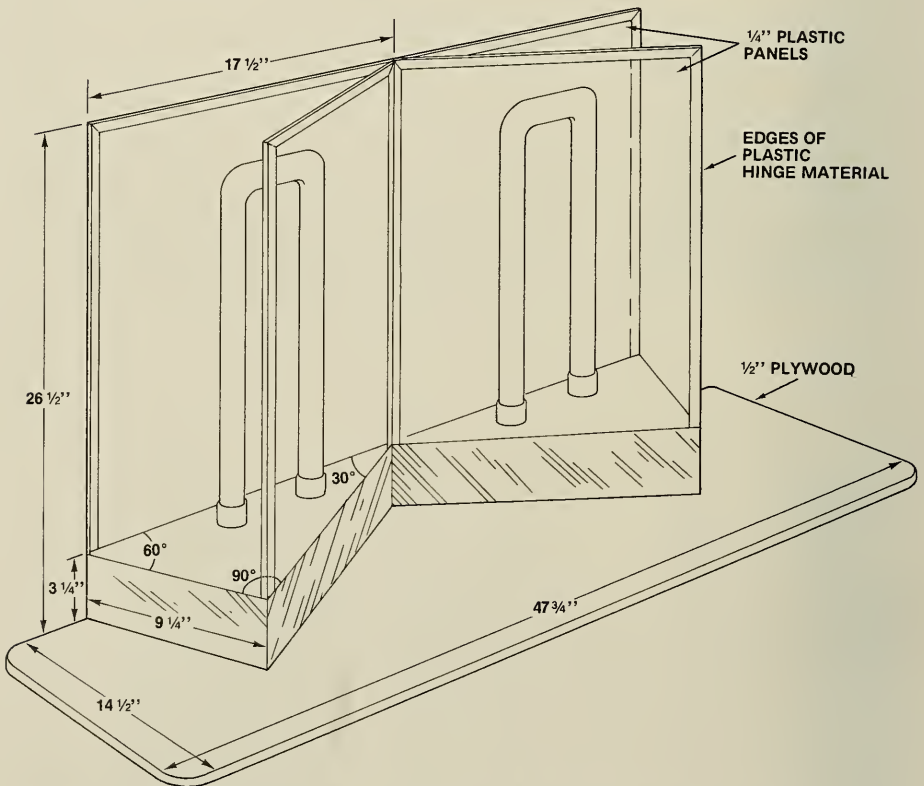
Name	Mature Size	Light Level	Water Requirement
<i>Pleomele reflexa</i> (Green pleomele)	floor plant	medium	wet
<i>Podocarpus macrophylla Maki</i> (Podocarpus)	tree, floor, pot plant	high	moist
<i>Polyscias guilfoylei</i> (Parsley aralia)	floor, pot plant	medium	moist
<i>Prunella malacoides</i> (Fairy primrose)	pot plant	high	moist
<i>Primula obconica</i> (German primrose)	pot plant	high	moist
<i>Punica granatum</i> var. <i>nana</i>	pot plant	high	moist
<i>Rhapis excelsa</i> (Lady palm)	tree, floor plant	medium	wet
<i>Rhipsalidopsis gaertneri</i> (Easter cactus)	pot, hanging plant	high	moist-in growth dry-over winter
<i>Rohdea japonica</i> (Japanese rohdea)	pot plant	medium	moist
<i>Rosa chinensis</i> var. <i>minima</i> (Miniature rose)	pot plant	very high	wet
<i>Saintpaulia</i> species (African violets)	pot, hanging plant	very high	moist
<i>Salvia splendens</i> (Scarlet sage)	pot plant	very high	moist
<i>Saxifraga stolonifera</i> var. <i>tricolor</i> (Variegated strawberry-geranium)	pot, hanging, terrarium plant	very high	dry
<i>Schlumbergea bridgesii</i> (Christmas cactus)	pot, hanging plant	high	moist-in growth dry-over winter
<i>Selaginella lepidophylla</i> (Resurrection plant)	pot, terrarium plant	medium to low	moist
<i>Senecio cruentus</i> (Cineraria)	pot plant	high	moist
<i>Senecio mikanioides</i> (German ivy)	pot, hanging, terrarium plant	medium	moist
<i>Seicranea purpurea</i> (Purple heart)	pot, hanging, terrarium plant	medium	dry
<i>Simingia</i> species (Gloxinia)	pot, hanging plant	very high	wet
<i>Solanum pseudo-capsicum</i> (Jerusalem cherry)	pot, hanging plant	high	dry
<i>Spathiphyllum "Mauna Loa"</i> (White flag)	pot plant	medium	dry
<i>Streptocarpus</i> species (Cape-primrose)	pot plant	high	moist
<i>Sygonium podophyllum</i> (Nepththytis)	pot, hanging, terrarium plant	low	moist

<i>Tagetes</i> species (Marigold)	pot plant	very high	moist
<i>Tohnia memiezii</i> (Piggy-back plant)	pot, hanging plant	high	moist
<i>Tradescantia</i> species (Wandering Jew)	pot, hanging, terrarium plant	medium	dry
<i>Vinca major</i> var. <i>variegata</i> (Periwinkle)	pot, hanging plant	high	moist
<i>Zantedeschia</i> species (Calla-lily)	pot plant	high	wet-in growth
<i>Zebrina</i> species (Wandering Jew)	pot, hanging, terrarium plant	medium	dry-when dormant
<i>Zygocactus truncatus</i> (Thanksgiving cactus)	pot, hanging plant	high	moist
			moist-in growth
			dry-over winter



PN-5267

Angular table planter (Plan H) permits the lighting of a long platform displaying many plants.



Plan H.—Angular table planter mounts two U-shaped fluorescent lamps and is backed by plexi-glass mirrors.

CARE OF THE GARDEN

After you have selected plants that grow well indoors, your success in growing them depends primarily on the care you give them. You should water the plants thoroughly but infrequently, fertilize them periodically, and illuminate them adequately and regularly.

TRAINING PLANTS

Knowing what constitutes an adjusted or conditioned plant enables you to exert maximum control over

its growth. Your plant has no native ability to live in the surroundings you have picked for it—whether home, office, or public area. It needs to be trained to adjust to its alien environment.

To aid in this adjustment, you must—

- Slow down plant growth.
- Permit leaves to get accustomed to dark, dry conditions in the area where the plant is to be placed.
- Permit the plant to accumulate mineral ions and carbohydrates to help maintain itself during periods of stress.



Office planter (Plan I) is designed to light a restricted area of plants.

PN-5268



PN-5269

Window-on-the-wall planter (Plan J) allows the display of large, growth plants in the home.

These procedures will assure a conditioned plant; they require much patience, but they are well worth the effect.

Conditioned Plants

A conditioned plant has the following characteristics—

- All the foliage is dark green, thick, and plush looking.
- The foliage is green all the way to the soil line.
- Growth is slowed and, consequently, few or no new leaves are showing. The little growth that does show is dark green. The stem at the top of the plant is thick in diameter.
- The net of roots is well established and fills most of the pot, covering the whole surface of the soil ball.

There are certain things you can do

at the beginning that will make for well-adjusted or conditioned plants. Here are some points to keep in mind—

Choosing plants.—The plant you pick depends on your taste, space available, and use. Every plant should be potted individually. It is almost impossible to train plants when they are potted together.

Washing and cleaning plants.—All plants except those with hairy-surfaced leaves (African violets and begonias) should be washed in warm soapy water of bath temperature, about 90° to 100° F. Wash all leaves, stems, and buds. Clean both sides of leaves. Be sure to support each individual leaf with your hand while doing this. Rinse with water, shake, and allow to dry overnight in the sink or on a newspaper. This procedure removes dirt, insect eggs, and

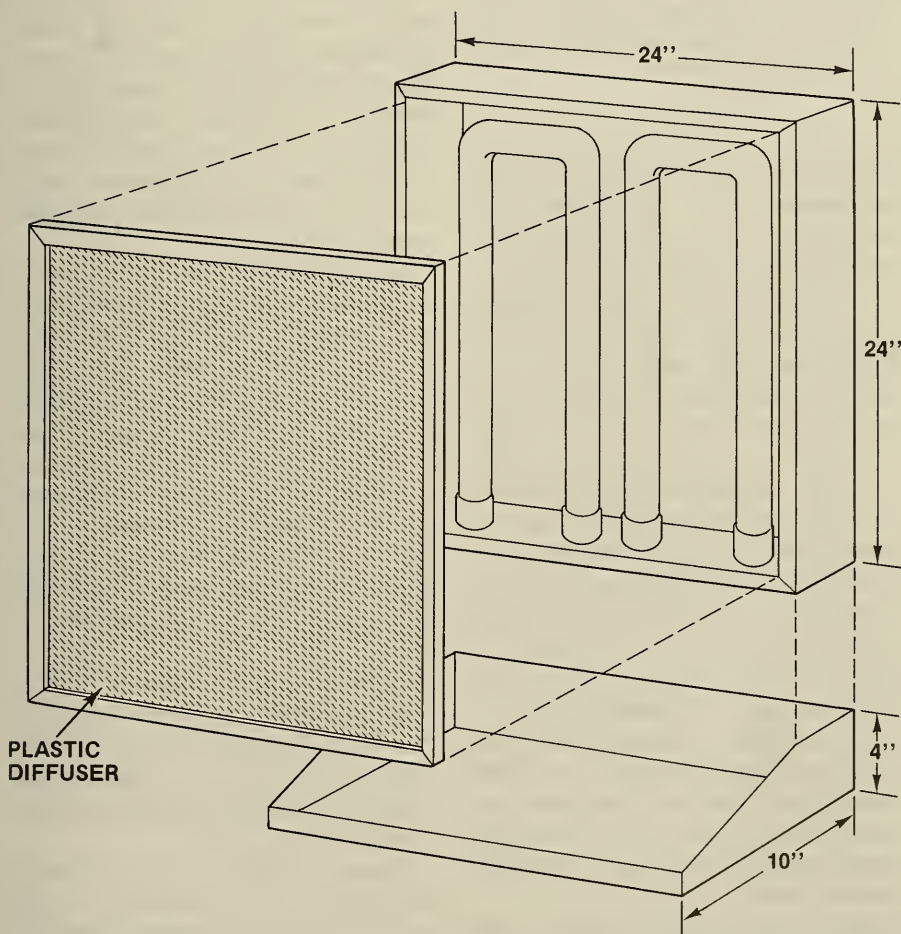
insecticides. Repeat at frequent intervals to bring out the natural shine of the foliage.

Locating training area.—Pick a spot with bright light, but avoid places where direct sunlight shines on the leaves. Keep plants away from drafts, heating ducts, or open doors. Place them on a waterproof area; this may be a wooden frame covered with polyethylene which is then covered with a layer of coarse gravel or sand.

Or use colorful inexpensive plastic trays, tubs, pans, and basins. Take care not to scar the underside of these containers—it ruins the waterproofing.

Buying fertilizer.—Since plants need at least 12 elements for growth, buy a complete fertilizer. The label should list the major ingredients: nitrogen, potassium and phosphorus, and a mixture of trace elements.

Some gardeners prefer a liquid fer-



Plan J.—Window-on-the-wall planter is made from a ceiling fixture turned on its side. Its fluorescent lamps are covered with a translucent plastic panel.



PN-5270

The Garden Center (Plan K) provides extra space for such gardening aids as growing media, containers, and fertilizer in its bottom folding panel.

tilizer that is easy to mix and whose concentration can be adjusted. The elements in a good fertilizer are immediately available to the plant.

Low but more frequent applications of fertilizer help sustain growth better than high rates. Do not over fertilize because it promotes soft growth. (See "General Care" section on p. 37.)

Water requirements.—After you have provided the plant with light, a waterproof area, and fertilizer, you must determine how much water the container, soil, and root system will hold. It is essential to know *how many ounces or cups of water the plant medium will require.*

The soil and roots are a mass filled with pore spaces; it is best to add the water until the area is filled and everything is moist. Leave no excess water standing. Mark on a label the amount used.

To be absolutely certain of the plant's water requirements use the following method. Buy a large plastic

or metal funnel and mark the 1, 2, and 3-cup lines inside. Plunge the funnel into the soil and fill with a measured amount of water. Leave the funnel in place overnight. Continue to add water until no additional water enters the growing medium. The soil medium will hold water by gravity, but will not hold any excess. Note the amount each container needs. From then on you can automatically calculate the correct amount of water. (See "General Care" section on p. 37.)

Training tips.— When plants require water they begin to change from dark to light green and become flaccid. Start to train your plant by watering it every third day to saturation as described under "Water requirements." Then begin to delay the time that you would normally water it.

Watering periods are best noted on a calendar, keeping in mind the moisture requirements in the table on p. 26. With this procedure, you permit the medium to become a little dryer and slow down top growth, while maintaining an active root system.

It takes at least 3 months for most plants to adjust their growth. Not all plants can be managed this way. Some, like violets, must be watered almost daily and never permitted to dry.

Adjusting light levels.—At first, keep the plant away from the window in a darker part of the room. After 3 to 6 months, move it to the desired location to light levels as listed on the table on p. 26.

Keeping plants in shape.—Check your plants every 3 months to keep them in shape. Maintain a definite water and fertilizer schedule for best growth. Also keep a regular schedule

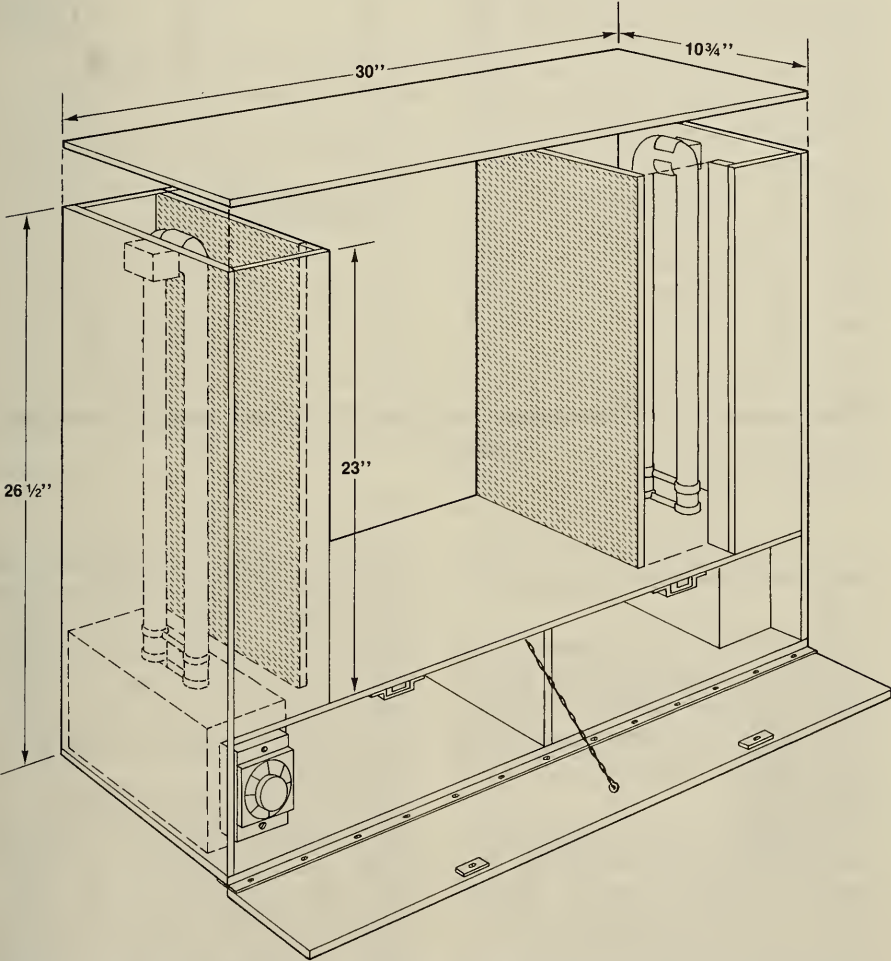
for pruning, removing dead leaves, and for staking.

Planning for replacements.—Remember to plan for replacements. In time, all plants become root bound in pots and overgrown in size. The medium becomes filled with roots and depleted of organic matter. When there's no more room for the plants it is time to try new plants and new combinations.

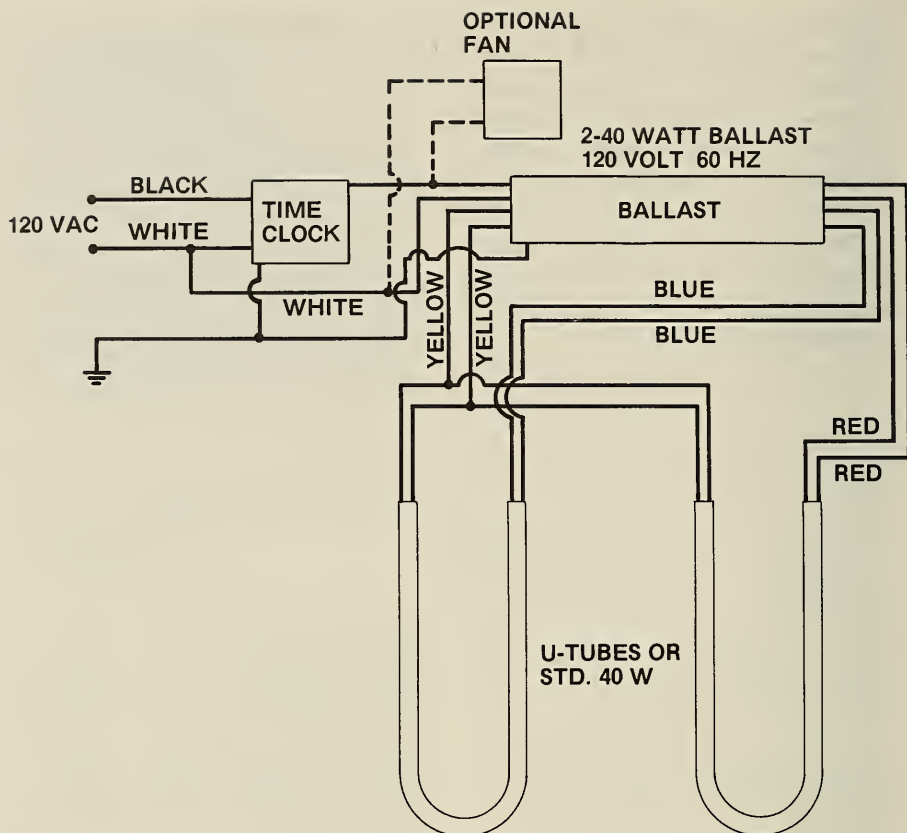
GENERAL CARE

Watering

Of all steps in the care of an indoor garden, watering is most important. If plants do not get enough water, they dry out and die. If they get too much water, they drown or rot. The proper procedure is to water thoroughly, but only often enough to pre-



Plan K.—The Garden Center is a free-standing gardening area which utilizes both lamps and mirrors to provide uniform illumination.



Wiring diagram is for two 40-watt standard or U-tubes. Wiring should conform to national electric and local codes.

vent wilting. Specific water requirements are given in the plant guide on p. 26.

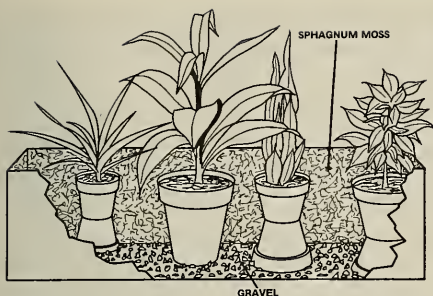
As soon as you put plants in the garden, begin adjusting them to their new indoor environment. Water the soil, clay pot, and surrounding media to saturation. But do not flood the planter box.

Allow the whole garden to dry until the plants are near wilting. You can detect wilting early by watching the leaves; they change from green to gray-green and begin to droop.

When the plants begin to wilt, water them thoroughly again.

While plants are adjusting to the indoors, some of the oldest leaves may yellow. If so, remove them. Wash the remaining leaves with warm soapy water, rinse with clear water, and stake the plants. They should now be ready for a long life in the indoor garden.

Set up a schedule for watering. If you are combining plants with different water requirements, label each type with small plastic tags. For example, green tags could be used for plants needing frequent watering (wet), yellow tags for less frequent watering (moist), and so on.



Pots in the planter box are raised to a uniform level. Space between them is filled with unmilled sphagnum moss.

Dry plants need watering every 10 to 14 days. These plants tend to have coarse roots and are well adapted to dark and dry conditions. They can be trained to withstand prolonged periods of slowed growth which delays rate of leaf formation, prevents death of old leaves, and helps retain the size of the plant. *More frequent* watering will cause new leaves to grow at a rapid rate, and usually an old leaf will die for every new leaf formed. *Less frequent* watering will cause many leaves to die.

Moist plants need watering every 4 to 7 days. These plants tend to have a fine root system that will die immediately if the soil dries out. *More frequent* or *less frequent* watering will cause same results as for "dry" plants.

Wet plants need watering every other day. They must have a relatively uniform amount of water in the growing media at all times. Even one period of drying usually means damage to the leaves and the possibility that the plant will die eventually. Do not let potted plants stand in saucers holding water.

Wet moss on the surface of the planter tends to raise the relative

humidity of the air around the plants as moisture evaporates from it. This high humidity is beneficial to the plants.

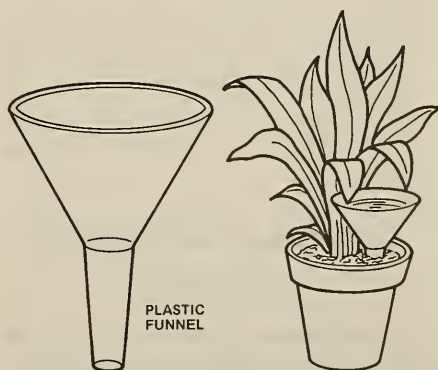
Do not bother syringing the plants to raise the humidity. Syringing seldom is effective; the humidity remains high only for a few minutes. And there is danger of spilling water on furnishings in the room.

When you are watering, do not get water on the lamps, fixtures, or planter.

More information on watering:

- Germinating seeds and seedlings may need daily watering. Seedlings have very fine, sensitive root systems that dry out easily, particularly under the heat of artificial light. Check soil daily to prevent drying and damage.

- Water temperature is unimportant for most plants because water quickly reaches temperature of surrounding area. However, the leaves of African violets may lose green color (chlorophyll) if water temperature is even 15° warmer or colder than leaf temperature. Avoid splashing water on the foliage. Plants take up water through roots, not through stems or leaves.



Plastic funnel used as aid in watering.

- You can use drinking water directly from the faucet for most plants, but some plants (such as ferns and African violets) are sensitive to the chlorine in the water. For these, allow water to stand overnight before using; chlorine escapes into the atmosphere while the water is standing.

- If water is unacceptable to a person when judged by taste, color, and smell it will not be acceptable to plants.

- Do not reuse water drained from plants. This water does not have the oxygen that plants need and it may contain disease organisms and unused salts that will damage plant roots.

Fertilizing

Water and fertilize plants at the same time to insure proper uptake of nutrients and distribution throughout the growing media. Usually adding fertilizer every third or fourth time (every 2 to 4 weeks) you water is sufficient to maintain good growth.

Use a water-soluble fertilizer at the strength recommended on the label. Fertilize only when plants are actively growing.

Even when you use soluble fertilizers, you may notice an accumulation of fertilizer on the surface of the soil; it will be a white, crusty deposit. This deposit should be removed, along with a little of the surface soil, and replaced with new soil.

SPECIAL GARDENING

Terrariums

Select plants which are compatible as to growing media, light, and moisture needs. Clean all foliage and

scrub surfaces with vegetable brush to remove dust, disease, and insect debris. Healthy plants must be chosen if the terrarium is to thrive.

The container chosen for the terrarium must be both clear and waterproof. One can use candy jars, aquariums, condiment or beverage jars, or bottles of any size. Wash the container and remove all labels and traces of the previous contents. Allow them to dry completely before beginning the terrarium. Remember that all things that go into the construction of a terrarium should be *dry*. Leave all items out to dry at least overnight; this will make assembly of the terrarium much easier and permit quick cleanup at the end.

The following items will be necessary to create a terrarium: (1) a container, (2) coarse sphagnum moss for bottom layer, (3) pasteurized potting mix, (4) cuttings and rooted plants, (5) a long stick of pencil diameter to handle plants, and (6) a wash bottle.

When all material has been assembled, do the following—

- Put a thin layer of moss on the bottom of the bottle. Firm with a stick to make a slanting base. The depth of the layer depends on bottle size; 1/2 to 3/4-inch is usually deep enough for most bottles.

- Put at least 1/2 to 3/4-inch of potting mix over the coarse moss. Use stick to level and firm up the structure of the potting mix.

- Select plants and try to blend their shape, foliage color, and height. Carefully remove most of the potting mix from the plants. Trim all roots 2 to 3 inches and remove all diseased or damaged foliage or branches.

- Group the plants outside the bottle first to decide on arrangement.



PN-5274

Containers of many different shapes and sizes can be used for terrariums.

Use stick to guide each plant into the bottle.

- Fan out the roots on the potting mix and shift dry potting mix over them; firm them into place with the stick. Tap and shake the bottle to force the growing media to shift down between the foliage. Starting at the back of the terrarium, add one plant at a time, firming all plants and media into place with the stick.

- Move the foliage and branches around to face in one direction with the stick. Working slowly, use stick to slide pieces of ground moss or painted gravel into place to cover the bottom of the bottle. Make sure all surfaces are still dry—it should be easy to move, place, and clean up inside of the terrarium.

- Water the terrarium by using a wash bottle or a thin plastic tube. Allow water to flow down the inside of the bottle, gently and slowly moisten coarse moss, potting mix, and covering. Do not sprinkle foliage or add so much water that you can see water standing in the bottom. If the terrarium is put together properly, you should be able to tilt the terrarium to allow the excess water to drain out.

- When the terrarium is finished, place it in a cool, lightly shaded area. Leave top off the bottle and allow all surfaces—foliage, media, bottle—to thoroughly air dry. To clean sides of the bottle use paper towelling on the stick. Look for damaged or dying leaves and remove them.



PN-5273

Terrarium plants should be carefully watered using a wash bottle or a thin plastic tube. Never water to the point where it will stand at the bottom.

Leave the bottle open for several days to correct the relative humidity. Place top on bottle but *do not seal*. Sealed bottles will cause plants to rot; a slight exchange of oxygen and carbon dioxide is necessary for the terrarium to survive.

Display the terrarium by placing it anywhere in the naturally lighted area of the home. Do not place it where it will be subjected to direct sunlight or near a heating or cooling duct. To render the bottle scar proof paste a piece of felt on the bottom with rubber cement.

Terrariums require little care. If everything has been done properly then a balanced environment will

have been created and water loss will be minimal. Signs that the terrarium needs water are foliage that crinkles at the edges and bottom moss that turns from dark to light brown. As before, use wash bottle or fine tubing to flow water down the sides of the bottle; remember to add water until all surfaces are moistened but *allow no excess water to stand in the bottom of the bottle*. Turn the bottle upside down to permit all excess water to drain away.

Do not fertilize the plants at first. Fertilizing promotes excessive growth which will rapidly fill the bottle. After 6 to 9 months add regular house-plant type fertilizer using at

least one-quarter of the concentration recommended for ordinary house plants.

Eventually, plants will overgrow the space allotted them. When this occurs, chemically prune the tips of the plants by touching the growing point with a swab dipped in rubbing alcohol. Only the tips will die after this treatment and side branches will develop.

One should expect no more than a useful life of 1 year for plants in a terrarium. Poor plants should be discarded after this period and the remaining plants used again in another terrarium.

Plants that make good natural groupings in terrariums are cacti and succulents, native understory plants, and small-leave house plants. Do not mix types because they have different media, water, and light level requirements. Easy-to-handle plants are: *Begonia*, Birds-nest fern, Boxwood, *Calathea*, *Chamaedorea* palm, *Chlorophytum* (Spider plant), *Euonymus* (Creeper), Fittonia, *Gynura* (Velvet plant), *Hedera* (English ivy), *Hemigraphis*, Maidenhair fern, *Maranta* (Prayer plant), Peperomias, *Pilea* (Aluminum plant), *Scindapsus* (Devil's ivy), *Tradescantia*, and *Zebrina*.

Hanging Baskets

The highest levels of light found in most rooms occur near or at the top of the windows. Hanging baskets permit indoor gardeners to utilize this light to grow the wide range of plants listed in the plant guide on p. 26.

To grow plants in hanging baskets take the following steps.—

Container.—Use any type of container that will hold at least 2 quarts

of growing media by volume. Containers with less volume tend to dry out rapidly. Containers can be metal framed and lined with moss. Use bleach bottles that are available commercially, gallon-sized milk containers, or redwood containers.

Be sure to provide drainage holes in the container. Use a nail to drive holes that are three-eighths of an inch in diameter, spaced 3 inches apart near the bottom of the container. Tie a cord or hemp bag around the container to make it into a hanging basket.

Hanging baskets are also available with self-adhering saucers. Thus, one can grow and water plants anywhere while preventing water drippings on furnishings.

Growing media.—Bagged growing media is available in most variety and garden stores. These usually contain fertilizers in slow-release form.

To make your own general-purpose mix use the following formula: To 2 parts of sandy loam soil add 1 part coarse sphagnum peat moss and 1 part coarse aggregate (vermiculite, perlite, or washed cinders). To each bushel of mix add 4 ounces of pulverized dolomitic limestone, 4 ounces of 20 percent superphosphate, and 2 ounces of 5-10-5 fertilizer. Mix thoroughly and add just enough water to crumble the media in large masses; do not add so much water the media becomes soggy.

Drainage.—Line the bottom 2 inches of the container with coarse aggregate. Shield the drainage holes with coffee filters to hold the growing media in place until the new root system meshes into a solid mass. Pack the aggregate loosely to leave air pockets that will permit easy drainage of water out of the con-



PN-5272

Containers for indoor gardening are as varied as the plants that may be grown in them.

tainer. Cover the top of the aggregate with a half-inch layer of aggregate that has been finely crushed; this will prevent the growing media from plugging up the drainage holes.

Fertilizer.—Fill container to within 1 inch of the top with water-moistened growing media. Mix in 1 tablespoon of a coated, slow-release 14-14-14 fertilizer per 6-inch container. The volume of a 6-inch container is equal to 2 quarts of mix. This concentration of fertilizer should last for about 3 months; plan to add a second tablespoon on the surface about 2-1/2 months after planting. Continue to fertilize at regular intervals throughout the life of the plant.

Planting.—Hold the potted plant on its side with one hand protecting the plant. Tap the plant gently until the soil ball and plant falls out. Remove the network of roots on bottom of soil ball. Dig a hole in which the soil ball fits perfectly. The growing media of the soil ball and of

the new container should be on the same level. Firm the soil ball and growing media to insure a good flow of water and the knitting of the root system.

Location.—Plants, like petunias, that require at least 6 hours daily of direct sunlight should be placed in areas where they will be shaded for part of the day. They can be placed near a porch, in a window, or close to the entrance of your home. (Petunias grown in too much shade develop long, poorly-branched shoots with few if any flowers; petunias are adapted to bright, sunny situations where they develop stout, highly-branched shoots with abundant flowering and fruiting.)

Watering.—When you water the plant, continue to add water until all areas of the growing media are thoroughly moistened and excess water begins to drip from the drainage holes. This volume of water will be adequate if sufficient air space above the growing media and the top of the container has been provided. Note how much water has been added and apply the same volume next time.

Acclimatization.—To promote abundant flowering and to prolong the flowering time, the plant must be acclimatized or “trained to survive” in its location. This is accomplished by watering frequency and controlled fertilizer levels. Examine the plant when freshly planted and do not water until the leaves change from dark to pale green, and have a wilting appearance.

When watering the growing media keep water off the leaves. Do not water again until the plant shows signs of wilting; this treatment slows growth and will help the plant survive sudden changes in the environment.

Grooming.—To preserve the appearance of the plant pick off yellowing or damaged leaves and flowers. As the plant develops, remove some branches to prevent crowding and to promote the development of new flowering shoots. To expose all sides of the plant to the environment, turn the container at weekly intervals. This will help the symmetrical development of the plant and will balance out the effects of the different exposures.

Plants For The Beginner

The *Peperomia obtusifolia* (or peperomia plant) is a good plant for a beginner to experiment with, and is available in either a solid green or in various green and white combinations.

This plant requires minimum care and can be trained to go into a cabinet, a dark corner in a hallway, or into a hanging waterproof basket. However, it will die rapidly if overwatered and overfertilized. It must be trained. The peperomia is from trop-

ical South and Central America. Its fleshy leaves are about 4 inches long and 2-1/2 inches wide. It branches rapidly and its stems fall over the surface of the container.

Another plant that is interesting to experiment with is the *Spathiphyllum "Mauna Loa."* This plant, originally from Columbia, has long, green, lance-shaped foliage that forms spathes (large, leaf-like parts enclosing a flower cluster) that are 2-1/2 inches long. The spadix (the fleshy spike of tiny flowers often enclosed in a spathe) is greenish-yellow to white. The plant is aesthetic to look at and throws interesting shadows around it giving the impression of wide-open spaces. The plant must be kept moist at all times to survive.

The *Ficus retusa nitida*, small-leaf rubber tree from the Indian and Malayan tropics, can be easily handled by the novice. It can be trained to any form by pruning. It has dark-green foliage 2 to 4 inches long, and is available on the market as a 6-foot tree in poodle, screen, or fan forms.

A Dozen Recommended Plants For Beginners

Name of plant	Light level	water requirement
<i>Aechmea fasciata</i> (Bromeliad)	medium	moist
<i>Aglaonema roebelinii</i> (Pewter plant)	low	moist
<i>Brassaia actinophylla</i> (Schefflera)	medium	dry
<i>Chamaedorea elegans</i> (Neanthe bella palm)	low	moist
<i>Dieffenbachia amoena</i> (Dumb cane)	medium	dry
<i>Dracaena fragrans</i> (Corn plant)	low	wet
<i>Fatsia japonica</i> (Japanese aralia)	medium	moist
<i>Ficus elastica 'Decora'</i> (Rubber plant)	medium	moist
<i>Hoya carnosa</i> (Wax plant)	medium	dry
<i>Maranta leuconeura</i> (Prayer plant)	medium	moist
<i>Nephrolepis exalta bostoniensis</i> (Boston fern)	medium	moist
<i>Podocarpus macrophyllus 'Maki'</i> (Podocarpus)	high	moist

Unless trained, it rapidly loses its leaves. It should be watered about once a week.

Other Care

About once a week, turn each of the pots in the planter. This encourages even development of the plants and keeps them from rooting into the sphagnum moss through the drain hole of the pot.

It plants get old, sick, or oversize, take them out of the planter and replace them with new, healthy, moderate-size plants.

If you are having insect problems in your indoor garden follow the instructions in Home and Garden Bulletin No. 67, "Insects and Related Pests of House Plants." Single copies of this publication—prepared by the Agricultural Research Service—can

While you're away

Many house plants die while the owner is away from home on a vacation or business trip. If you cannot get someone to care for your plants, cover the plants with a polyethylene sheet and tie it to the pot or box to prevent loss of moisture. Reduce the lighting to 8 hours a day.

If you have time before leaving, you can train the plants to get along with a little water. If not, just give them a good drink, using the funnel method, before you leave.

Plants usually can get along satisfactorily by themselves for about 2 weeks. If you must be away for more than 2 weeks, you can expect to lose some of your plants, particularly flowering plants.

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be obtained free from your County Extension Agent or by writing to the Office of Governmental and Public Affairs, U.S. Department of Agriculture, Washington, D.C. 20250. Send your request on a postcard. Be sure to include your ZIP Code.

OTHER USES

In addition to using your indoor garden for growing conventional house plants, you can use it for displaying plant collections such as mosses, ivies, orchids, or bonsai (dwarf plants). If you use the garden for orchids, surround it with a clear plastic-sheet material to hold in moisture and keep the humidity high.

Or you may want to display potted plants from the florist—plants that you intend to discard after their flowers pass. Because many of their needs are met by the garden, these potted plants last considerably longer there than they would on a table or window sill. Actually, the plants may continue to grow in the garden.

If you intend to use your garden exclusively for display of florist plants, you might have a metal pan made to fit over the floor of the planter. The pan should be 3 or 4 inches deep and painted to match the planter.

Fill the pan with pea gravel or marble chips and set the plants in the gravel-filled pan. When you water the plants, let some of the water drain into the pan; evaporation from the gravel or marble chips will increase the humidity of the air around the plants.

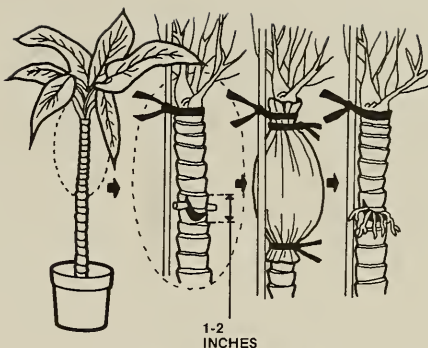
AIR LAYERING

If you wish to propagate plants, you can try air layering for plants that have stiff or woody stems and eventually grow too tall to be attractive.

Do it this way. Attach the stem securely to a stake. Make an upward cut into the stem, separating the bark by inserting a small stick. Cover the cut area with a ball of moist, but not soggy, sphagnum moss. Then cover the moss with polyethylene film and tape it at each end to reduce water loss.

Continue to grow the mother plant in the usual way. When you can see the roots in the moss, cut the rooted top off the mother plant and pot the rooting.

Allow the mother plant to continue growing; new lateral branches often



Steps in air layering.

develop down the stem. You can air layer the same mother plant many times as new lateral shoots develop.

MORE INFORMATION

Single copies of this publication and Home and Garden Bulletin No. 82, "Selecting and Growing House Plants," may be obtained free from your County Extension Agent or by writing to the Office of Governmental and Public Affairs, U.S. Department of Agriculture, Washington, D.C. 20250. Send your request on a postcard. Please include your ZIP code and your return address.

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